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Search for

NiceZyme View of ENZYME: EC 4.2.1.94

Official Name	
Scytalone dehydratase.	
Reaction catalysed	
Scytalone <=> 1,3,8-trihydroxynaphthalene + H(2)O	
Comment(s)	
Involved with EC 1.1.1.252 in the biosynthesis of melanin in pathogenic fungi.	
Cross-references	
BRENDA	4.2.1.94
PUMA2	4.2.1.94
PRIAM enzyme-specific profiles	4.2.1.94
KEGG Ligand Database for Enzyme Nomenclature	4.2.1.94
IUBMB Enzyme Nomenclature	4.2.1.94
IntEnz	4.2.1.94
MEDLINE	Find literature relating to 4.2.1.94
MetaCyc	4.2.1.94
UniProtKB/Swiss-Prot	014434, SCYD_ASPFU; Q00455, SCYD_GLOLA; P56221, SCYD_MAGGR

[View entry in original ENZYME format](#)

[View entry in raw text format \(no links\)](#)

All UniProtKB/Swiss-Prot entries referenced in this entry, with possibility to download in different formats, align etc.

All ENZYME / UniProtKB/Swiss-Prot entries corresponding to 4.2.1.-

All ENZYME / UniProtKB/Swiss-Prot entries corresponding to 4.2.-.-

All ENZYME / UniProtKB/Swiss-Prot entries corresponding to 4.-.-.-



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11-975

208143

STIC-Biotech/ChemLib

LB

CRFE

From: Ramirez, Delia
Sent: Tuesday, November 21, 2006 1:44 PM
To: STIC-Biotech/ChemLib
Subject: 10/507132

Hi,

I would like to request the following searches:

1. SEQ ID NO:1 and 2 in the nucleic acid databases (commercial & interference)
2. SEQ ID NO:2 in the protein databases (commercial & interference)
3. an alignment of SEQ ID NO:2 and 4.

Please provide a printout of the results.

Thank you very much,

Delia M. Ramirez, Ph.D.
Patent Examiner
Recombinant Enzymes-Art Unit 1652
USPTO
400 Dulany Street, Remsen Bldg., 2D74, Mail room 2C70
Alexandria, VA 22314
(571) 272-0938
delia.ramirez@uspto.gov

1-516na
2-172aa
4-172aa
LB

Searcher: _____
Searcher Phone: _____
Date Searcher Picked up: _____
Date completed: _____
Searcher Prep Time: _____
Online Time: _____

Type of Search
NA# _____ AA# _____
S/L: _____ Oligomer: _____
Encode/Transl: _____
Structure #: _____ Text: _____
Inventor: _____ Litigation: _____

Vendors and cost where applicable
STN: _____
DIALOG: _____
QUESTEL/ORBIT: _____
LEXIS/NEXIS: _____
SEQUENCE SYSTEM: _____
WWW/Internet: _____
Other (Specify): _____

11-975

STIC-Biotech/ChemLib

CB

From: Ramirez, Delia
Sent: Tuesday, November 21, 2006 1:53 PM
To: STIC-Biotech/ChemLib
Subject: 10/507132

CRFE

Hi,

I would like to request the following search: an oligo search of SEQ ID NO:4 in the protein and nucleic acid databases (commercial).

Please provide a printout of the results.

Thank you very much,

Delia M. Ramirez, Ph.D.
Patent Examiner
Recombinant Enzymes-Art Unit 1652
USPTO
400 Dulany Street, Remsen Bldg., 2D74, Mail room 2C70
Alexandria, VA 22314
(571) 272-0938
delia.ramirez@uspto.gov

4-172aa
LB

Searcher: _____
Searcher Phone: _____
Date Searcher Picked up: _____
Date completed: _____
Searcher Prep Time: _____
Online Time: _____

Type of Search
NA# _____ AA# _____
S/L: _____ Oligomer: _____
Encode/Transl: _____
Structure #: _____ Text: _____
Inventor: _____ Litigation: _____

Vendors and cost where applicable
STN: _____
DIALOG: _____
QUESTEL/ORBIT: _____
LEXIS/NEXIS: _____
SEQUENCE SYSTEM: _____
WWW/Internet: _____
Other (Specify): _____

WEST Search History

DATE: Wednesday, January 24, 2007

Hide? Set Name Query**Hit Count***DB=PGPB,USPT,EPAB,JPAB,DWPI; PLUR=YES; OP=OR*

<input type="checkbox"/>	L2	L1 and (kaku or watanabe or kawai or shimizu or kawai or nagayama).in.	1
<input type="checkbox"/>	L1	scytalon\$4 same dehydratas\$4	6

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Search Results - Record(s) 1 through 6 of 6 returned.

☐ 1. Document ID: US 20060257976 A1

L1: Entry 1 of 6

File: PGPB

Nov 16, 2006

PGPUB-DOCUMENT-NUMBER: 20060257976

PGPUB-FILING-TYPE:

DOCUMENT-IDENTIFIER: US 20060257976 A1

TITLE: Methods and kits for propagating and evolving nucleic acids and proteins

PUBLICATION-DATE: November 16, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Makeyev; Eugene	Cambridge	MA	US
Bamford; Dennis	Helsinki		FI

US-CL-CURRENT: [435/91.2](#); [435/253.4](#), [435/325](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Image
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☐ 2. Document ID: US 20060223136 A1

L1: Entry 2 of 6

File: PGPB

Oct 5, 2006

PGPUB-DOCUMENT-NUMBER: 20060223136

PGPUB-FILING-TYPE:

DOCUMENT-IDENTIFIER: US 20060223136 A1

TITLE: Scytalone dehydrogenase gene showing tolerance to agricultural pesticide

PUBLICATION-DATE: October 5, 2006

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kaku; Koichiro	Shizuoka		JP
Watanabe; Satoshi	Shizuoka		JP
Kawai; Kiyoshi	Shizuoka		JP
Shimizu; Tsutomu	Shizuoka		JP
Nagayama; Kozo	Shizuoka		JP

US-CL-CURRENT: [435/32](#); [435/190](#), [435/254.1](#), [435/484](#), [435/69.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Image
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☐ 3. Document ID: US 20050118665 A1

L1: Entry 3 of 6

File: PGPB

Jun 2, 2005

PGPUB-DOCUMENT-NUMBER: 20050118665
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20050118665 A1

TITLE: Methods for conducting assays for enzyme activity on protein microarrays

PUBLICATION-DATE: June 2, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Zhou, Fang X.	New Haven	CT	US
Schweitzer, Barry	Cheshire	CT	US

US-CL-CURRENT: 435/23; 435/6

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: US 5837505 A

L1: Entry 4 of 6

File: USPT

Nov 17, 1998

US-PAT-NO: 5837505
DOCUMENT-IDENTIFIER: US 5837505 A

TITLE: Melanin production from transformed escherichia coli

DATE-ISSUED: November 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
della-Cioppa; Guy	Vacaville	CA		
Garger, Jr.; Stephen J.	Vacaville	CA		
Sverlow; Genadie G.	Vacaville	CA		
Turpen; Thomas H.	Vacaville	CA		
Grill; Laurence K.	Vacaville	CA		
Chedekal; Miles R.	Vacaville	CA		

US-CL-CURRENT: 435/128; 435/193; 435/244; 435/252.33; 536/23.2; 536/23.4

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Image
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☐ 5. Document ID: US 5814495 A

L1: Entry 5 of 6

File: USPT

Sep 29, 1998

US-PAT-NO: 5814495
DOCUMENT-IDENTIFIER: US 5814495 A

TITLE: Melanin production by streptomyces

DATE-ISSUED: September 29, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
della-Cioppa; Guy	Vacaville	CA		
Garger, Jr.; Stephen J.	Vacaville	CA		
Sverlow; Genadie G.	Vacaville	CA		
Turpen; Thomas H.	Vacaville	CA		
Grill; Laurence K.	Vacaville	CA		
Chedekal; Miles R.	Vacaville	CA		

US-CL-CURRENT: 435/120; 424/60, 435/191, 435/252.35, 435/253.5

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMIC	Draw Desc	Image
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☐ 6. Document ID: US 5631151 A

L1: Entry 6 of 6

File: USPT

May 20, 1997

US-PAT-NO: 5631151

DOCUMENT-IDENTIFIER: US 5631151 A

TITLE: Melanin production by transformed organisms

DATE-ISSUED: May 20, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
della-Cioppa; Guy	Vacaville	CA		
Garger, Jr.; Stephen J.	Vacaville	CA		
Sverlow; Genadie G.	Vacaville	CA		
Turpen; Thomas H.	Vacaville	CA		
Grill; Laurence K.	Vacaville	CA		
Chedekel; Miles R.	Orland	CA		
Kumagai; Monto H.	Davis	CA		

US-CL-CURRENT: 435/133; 435/108, 435/189, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMIC	Draw Desc	Image
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Documents

scytalon\$4 same dehydratas\$4

6

Display Format:

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=> d his full

(FILE 'HOME' ENTERED AT 12:51:03 ON 24 JAN 2007)

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 12:57:30 ON 24 JAN 2007
SEA SCYTALO?(S)DEHYDRATAS?

12 FILE AGRICOLA
1 FILE ANABSTR
12 FILE BIOENG
59 FILE BIOSIS
2 FILE BIOTECHABS
2 FILE BIOTECHDS
21 FILE BIOTECHNO
36 FILE CABA
72 FILE CAPLUS
17 FILE CROPU
2 FILE DISSABS
34 FILE EMBASE
41 FILE ESBIODASE
55 FILE GENBANK
1 FILE IFIPAT
8 FILE JICST-EPLUS
29 FILE LIFESCI
37 FILE MEDLINE
24 FILE PASCAL
75 FILE SCISEARCH
20 FILE TOXCENTER
6 FILE USPATFULL

L1 QUE SCYTALO?(S) DEHYDRATAS?

D RANK

FILE 'SCISEARCH, CAPLUS, BIOSIS, GENBANK, ESBIODASE, MEDLINE, CABA, EMBASE, LIFESCI, PASCAL' ENTERED AT 12:58:33 ON 24 JAN 2007

L2 462 SEA SCYTALO?(S) DEHYDRATAS?
L3 120 SEA L2(S) RICE?
L4 99 SEA L3(S)(INHIBIT? OR CARPROP?)
L5 63 SEA L2(S)(INHIBIT OR CARPROP? OR ANTAGON?)
L6 21 DUP REM L5 (42 DUPLICATES REMOVED)
D TI L6 1-21
D IBIB ABS L6 1-21

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NEWS	4	OCT 30	CHEMLIST enhanced with new search and display field
NEWS	5	NOV 03	JAPIO enhanced with IPC 8 features and functionality
NEWS	6	NOV 10	CA/Caplus F-Term thesaurus enhanced
NEWS	7	NOV 10	STN Express with Discover! free maintenance release Version 8.01c now available
NEWS	8	NOV 20	CAS Registry Number crossover limit increased to 300,000 in additional databases
NEWS	9	NOV 20	CA/Caplus to MARPAT accession number crossover limit increased to 50,000
NEWS	10	DEC 01	CAS REGISTRY updated with new ambiguity codes
NEWS	11	DEC 11	CAS REGISTRY chemical nomenclature enhanced
NEWS	12	DEC 14	WPIDS/WPINDEX/WPIX manual codes updated
NEWS	13	DEC 14	GBFULL and FRFULL enhanced with IPC 8 features and functionality
NEWS	14	DEC 18	CA/Caplus pre-1967 chemical substance index entries enhanced with preparation role
NEWS	15	DEC 18	CA/Caplus patent kind codes updated
NEWS	16	DEC 18	MARPAT to CA/Caplus accession number crossover limit increased to 50,000
NEWS	17	DEC 18	MEDLINE updated in preparation for 2007 reload
NEWS	18	DEC 27	CA/Caplus enhanced with more pre-1907 records
NEWS	19	JAN 08	CHEMLIST enhanced with New Zealand Inventory of Chemicals
NEWS	20	JAN 16	CA/Caplus Company Name Thesaurus enhanced and reloaded
NEWS	21	JAN 16	IPC version 2007.01 thesaurus available on STN
NEWS	22	JAN 16	WPIDS/WPINDEX/WPIX enhanced with IPC 8 reclassification data
NEWS	23	JAN 22	CA/Caplus updated with revised CAS roles
NEWS	24	JAN 22	CA/Caplus enhanced with patent applications from India
NEWS EXPRESS	NOVEMBER 10 CURRENT WINDOWS VERSION IS V8.01c, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 25 SEPTEMBER 2006.		
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FILE 'HOME' ENTERED AT 12:51:03 ON 24 JAN 2007

=> index bioscience medicine

FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED

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SINCE FILE	TOTAL
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2.31	2.31
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INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 12:57:30 ON 24 JAN 2007

71 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view search error messages that display as 0* with SET DETAIL OFF.

=> s scytalo?(s)dehydratas?

12	FILE AGRICOLA
1	FILE ANABSTR
12	FILE BIOENG
59	FILE BIOSIS
2	FILE BIOTECHABS
2	FILE BIOTECHDS
21	FILE BIOTECHNO
36	FILE CABA
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24 FILES SEARCHED...

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29	FILE LIFESCI
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24	FILE PASCAL
75	FILE SCISEARCH
20	FILE TOXCENTER
6	FILE USPATFULL

66 FILES SEARCHED...

22 FILES HAVE ONE OR MORE ANSWERS, 71 FILES SEARCHED IN STNINDEX

L1 QUE SCYTALO?(S) DEHYDRATAS?

=> d rank

F1	75	SCISEARCH
F2	72	CAPLUS
F3	59	BIOSIS
F4	55	GENBANK
F5	41	ESBIOBASE
F6	37	MEDLINE
F7	36	CABA
F8	34	EMBASE
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F10	24	PASCAL
F11	21	BIOTECHNO
F12	20	TOXCENTER
F13	17	CROPU

F14	12	AGRICOLA
F15	12	BIOENG
F16	8	JICST-EPLUS
F17	6	USPATFULL
F18	2	BIOTECHABS
F19	2	BIOTECHDS
F20	2	DISSABS
F21	1	ANABSTR
F22	1	IFIPAT

=> file f1-f10

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ENTRY

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SESSION

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3.57

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=> s scytalo?(s)dehydratas?

L2 462 SCYTALO?(S) DEHYDRATAS?

=> s l2(s)rice?

L3 120 L2(S) RICE?

=> s l3(s)(inhibit? or carprop?)

L4 99 L3(S) (INHIBIT? OR CARPROP?)

=> s l2(s)(inhibit or carprop? or antagon?)

L5 63 L2(S) (INHIBIT OR CARPROP? OR ANTAGON?)

=> dup rem l5

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ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE

PROCESSING COMPLETED FOR L5

L6 21 DUP REM L5 (42 DUPLICATES REMOVED)

=> d ti l6 1-21

L6 ANSWER 1 OF 21 CABA COPYRIGHT 2007 CABI on STN
TI Application of a PCR-luminex system for molecular diagnosis of Magnaporthe grisea isolates resistant to dehydratase inhibitors in melanin biosynthesis (MBI-D).

L6 ANSWER 2 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 1
TI Mechanism of resistance to carpropamid in Magnaporthe grisea

L6 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 2
TI Monitoring and characterization of Magnaporthe grisea isolates with decreased sensitivity to scytalone dehydratase inhibitors

L6 ANSWER 4 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 3
TI Enzymatic characterization of scytalone dehydratase Val75Met variant found in melanin biosynthesis dehydratase inhibitor (MBI-D) resistant strains of the rice blast fungus

L6 ANSWER 5 OF 21 CABA COPYRIGHT 2007 CABI on STN
TI Efficacy of carpropamid against mutants of Magnaporthe grisea at codon 75 on scytalone dehydratase.

L6 ANSWER 6 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN
TI Mode of action of nonfungicidal anti-blast chemicals

L6 ANSWER 7 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN
TI Diagnosis of dehydratase inhibitors in melanin biosynthesis inhibitor (MBI-D) resistance by primer-introduced restriction enzyme analysis in scytalone dehydratase gene of Magnaporthe grisea

L6 ANSWER 8 OF 21 Elsevier BIOBASE COPYRIGHT 2007 Elsevier Science B.V. on STN DUPLICATE
TI Inhibitors and genetic analysis of scytalone dehydratase confirm the presence of DHN-melanin pathway in sapstain fungi

L6 ANSWER 9 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN
TI Design of scytalone dehydratase-inhibiting rice blast fungicides

L6 ANSWER 10 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 5
TI Differential inhibition of a melanin biosynthetic enzyme scytalone dehydratase by carpropamid, a fungicide for rice blast control, and its isomers

L6 ANSWER 11 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN
TI Structural and functional analysis of scytalone dehydratase required for pathogenicity of the rice blast fungus

L6 ANSWER 12 OF 21 CABA COPYRIGHT 2007 CABI on STN
TI Efficient target-site assay of chemicals for melanin biosynthesis inhibition of Magnaporthe grisea.

L6 ANSWER 13 OF 21 CABA COPYRIGHT 2007 CABI on STN
TI Molecular action mechanism of a new melanin biosynthesis inhibitor.

L6 ANSWER 14 OF 21 CABA COPYRIGHT 2007 CABI on STN
TI Molecular action mechanism of nonfungicidal anti-blast chemicals.

L6 ANSWER 15 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 6

TI Cryogenic X-ray crystal structure analysis for the complex of scytalone dehydratase of a rice blast fungus and its tight-binding inhibitor, carpropamid: The structural basis of tight-binding inhibition

L6 ANSWER 16 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 7
 TI Carpropamid. A rice fungicide with two modes of action

L6 ANSWER 17 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 8
 TI Carpropamid. A new melanin biosynthesis inhibitor

L6 ANSWER 18 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 9
 TI Molecular action mechanism of nonfungicidal anti-blast chemicals

L6 ANSWER 19 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 10
 TI Inhibition of scytalone dehydratase in melanin biosynthesis by carpropamid, a novel rice blast controlling agent

L6 ANSWER 20 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 11
 TI Carpropamid, an anti-rice blast fungicide, inhibits scytalone dehydratase activity and appressorial penetration in Colletotrichum lagenarium

L6 ANSWER 21 OF 21 CABA COPYRIGHT 2007 CABI on STN
 TI The inhibition of melanin biosynthetic reactions in Pyricularia oryzae by compounds that prevent rice blast disease.

=> d ibib abs 16 1-21

L6 ANSWER 1 OF 21 CABA COPYRIGHT 2007 CABI on STN
 ACCESSION NUMBER: 2006:63722 CABA
 DOCUMENT NUMBER: 20063037076
 TITLE: Application of a PCR-luminex system for molecular diagnosis of Magnaporthe grisea isolates resistant to dehydratase inhibitors in melanin biosynthesis (MBI-D)
 AUTHOR: Ishii, H.; Tanoue, J.; Oshima, M.; Yamaguchi, J.; Nemoto, F.; So, K.; Dehne, H. W. [EDITOR]; Gisi, U. [EDITOR]; Kuck, K. H. [EDITOR]; Russell, P. E. [EDITOR]; Lyr, H. [EDITOR]
 CORPORATE SOURCE: National Institute for Agro-Environmental Sciences, Tsukuba, Ibaraki 305-8604, Japan.
 SOURCE: Modern fungicides and antifungal compounds IV: 14th International Reinhardtbrunn Symposium, Friedrichroda, Thuringia, Germany, April 25-29, 2004, (2005) pp. 31-34. 5 ref.
 Publisher: British Crop Protection Council. Alton
 Price: Book chapter; Conference paper
 Meeting Info.: Modern fungicides and antifungal compounds IV: 14th International Reinhardtbrunn Symposium, Friedrichroda, Thuringia, Germany, April 25-29, 2004.
 ISBN: 1-901396-39-8
 PUB. COUNTRY: United Kingdom
 DOCUMENT TYPE: Journal
 LANGUAGE: English
 ENTRY DATE: Entered STN: 5 Apr 2006
 Last Updated on STN: 5 Apr 2006

AB The total DNA of two M. grisea isolates resistant to carpropamid and two wild-type isolates of the fungus were extracted and served as template in PCR. After sequencing PCR products and digestion with a

restriction enzyme, it was confirmed that in resistant isolates, nucleotide changes from GTG (valine) to ATG (methionine) occurred at position 75 of the fungicide-targeted enzyme. A designed biotin-labelled reverse primer was used with a forward primer to amplify a fragment of the scytalone dehydratase gene. Biotinylated PCR-amplified product was hybridized to the oligonucleotide probes covalently coupled to fluorescent beads, and reactions were analysed on the Luminex 100 System. The two wild-type and two resistant isolates were successfully distinguished from each other based on the signal intensity of hybridization of specific oligonucleotide probes with their corresponding PCR products, which carried complementary nucleotide sequences. The results show that PCR-Luminex system is suitable for a high-throughput analysis of single nucleotide polymorphisms, and will thus be useful for comprehensive diagnosis of other point mutation-based fungicide resistance (e.g. benzimidazole and strobilurin resistance in plant pathogens).

L6 ANSWER 2 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on
STN DUPLICATE 1

ACCESSION NUMBER: 2004:809287 SCISEARCH
THE GENUINE ARTICLE: 849LE
TITLE: Mechanism of resistance to carpropamid in *Magnaporthe grisea*
AUTHOR: Takagaki M (Reprint); Kaku K; Watanabe S; Kawai K; Shimizu T; Sawada H; Kumakura K; Nagayama K
CORPORATE SOURCE: Kumiai Chem Ind Co Ltd, Life Sci Res Inst, 3360 Kamo, Shizuoka 4390031, Japan (Reprint); Kumiai Chem Ind Co Ltd, Life Sci Res Inst, Shizuoka 4390031, Japan; Bayer CropSci KK, Yuki Res Ctr, Ibaraki 3070001, Japan
m-takagaki@kumiai-chem.co.jp
COUNTRY OF AUTHOR: Japan
SOURCE: PEST MANAGEMENT SCIENCE, (SEP 2004) Vol. 60, No. 9, pp. 921-926.
ISSN: 1526-498X.
PUBLISHER: JOHN WILEY & SONS LTD, THE ATRIUM, SOUTHERN GATE, CHICHESTER PO19 8SQ, W SUSSEX, ENGLAND.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 28
ENTRY DATE: Entered STN: 2 Oct 2004
Last Updated on STN: 2 Oct 2004

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The inhibitory activity of carpropamid on scytalone dehydratase (SDH) extracted from a carpropamid-resistant strain of *Magnaporthe grisea* (Hebert) Barr was dramatically reduced in comparison with that on SDH extracted from the sensitive strain. A single-point mutation (G to A) located at the upstream region (233 bp downstream from the ATG codon) resulting in a one-amino-acid substitution (valine [GTG] 75 to methionine [ATG]: V75M) was found in the resistant strain. To examine whether the V75M mutation is the primary reason for decreasing the sensitivity of SDH to carpropamid, the SDH cDNAs of both the sensitive and the resistant strain were cloned into a GST-fused protein expression vector-system. The recombinant SDHs of both strains exhibited the same sensitivities to carpropamid as those extracted from the mycelia of the respective strains. These data clearly revealed that the V75M mutation causes the low sensitivities of the SDHs of the carpropamid-resistant strains, and strongly suggests that the V75M mutation confers resistance of these strains to carpropamid. (C) 2004 Society of Chemical Industry.

L6 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2004:636864 CAPLUS
DOCUMENT NUMBER: 141:345010
TITLE: Monitoring and characterization of *Magnaporthe grisea* isolates with decreased sensitivity to scytalone dehydratase inhibitors

AUTHOR(S): Sawada, Haruko; Sugihara, Minoru; Takagaki, Makiichi;
Nagayama, Koza
CORPORATE SOURCE: Bayer CropScience KK Yuki Research Centre, Yuki,
307-0001, Japan
SOURCE: Pest Management Science (2004), 60(8), 777-785
CODEN: PMSCFC; ISSN: 1526-498X
PUBLISHER: John Wiley & Sons Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Rice blast fungus isolates were collected in Kyushu to investigate resistance to scytalone dehydratase inhibitors of melanin biosynthesis (MBI-D). In 2001, failure of control of rice blast was reported in the Saga prefecture, where MBI-Ds have been used since 1998. At that time, the distribution of resistant isolates was mainly limited to that area. However, in 2002, resistant isolates were detected in all prefectures of Kyushu. DNA fingerprinting anal. showed that the mutation causing resistance to MBI-Ds had arisen independently in each area. These data suggest that resistant isolates may occur in any area and become dominant under continuous selection pressure for MBI-Ds. Nevertheless, resistant strains can be controlled by reductase inhibitors of melanin biosynthesis (MBI-R) or com. rice seed disinfectants.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 4 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 3

ACCESSION NUMBER: 2004:327763 CAPLUS
DOCUMENT NUMBER: 142:109230
TITLE: Enzymatic characterization of scytalone dehydratase Val75Met variant found in melanin biosynthesis dehydratase inhibitor (MBI-D) resistant strains of the rice blast fungus

AUTHOR(S): Yamada, Naoki; Motoyama, Takayuki; Nakasako, Masayoshi; Kagabu, Shinzo; Kudo, Toshiaki; Yamaguchi, Isamu

CORPORATE SOURCE: Department of Physics, Faculty of Science and Technology, Keio University, Kanagawa, 223-8522, Japan
SOURCE: Bioscience, Biotechnology, and Biochemistry (2004), 68(3), 615-621

CODEN: BBBIEJ; ISSN: 0916-8451
PUBLISHER: Japan Society for Bioscience, Biotechnology, and Agrochemistry

DOCUMENT TYPE: Journal
LANGUAGE: English

AB Carpropamid ((1RS,3SR)-2,2-dichloro-N-[(R)-1-(4-chlorophenyl)ethyl]-1-ethyl-3-methylcyclopropanecarboxamide) is a potent chemical against the rice blast fungus, *Pyricularia oryzae*. In 2001, isolates of the fungus with reduced sensitivity to this fungicide appeared in Saga Prefecture of Japan and were regarded as a potential threat to rice protection by carpropamid. The cause of the resistance has been identified genetically as a point mutation resulting in the Val75Met change in scytalone dehydratase, the primary target of the fungicide. We constructed an overexpression system of the variant enzyme and characterized the kinetics in the catalysis and the inhibition by carpropamid isomers. The variant enzyme retained a significant level of enzymic activity. Inhibition of the variant enzyme by carpropamid was more than 200-fold reduced in comparison with that of the wild-type. Based on the results, here we propose possible mechanisms of the carpropamid-resistance of the variant enzyme in retaining the normal enzymic activity.

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 5 OF 21 CABA COPYRIGHT 2007 CABI on STN

ACCESSION NUMBER: 2004:187880 CABA
DOCUMENT NUMBER: 20043174916
TITLE: Efficacy of carpropamid against mutants of

Magnaporthe grisea at codon 75 on scytalone dehydratase

AUTHOR: Shigyo, T.; Kuchii, Y.; Araki, Y.; Sawada, H.; Kawasaki, S. [EDITOR]

CORPORATE SOURCE: Nihon Bayer Agrochem K.K., Yuki Research Center, 9511-4, Yuki, Yuki City, Ibaraki 307-0001, Japan. takuma.shigyo@bayercropscience.com

SOURCE: Rice blast: interaction with rice and control. Proceedings of the 3rd International Rice Blast Conference, Tsukuba Science City, Ibaraki, Japan, 11 to 14 September 2002, (2004) pp. 281-287. 10 ref. Publisher: Kluwer Academic Publishers. Dordrecht Price: Book chapter; Conference paper Meeting Info.: Rice blast: interaction with rice and control. Proceedings of the 3rd International Rice Blast Conference, Tsukuba Science City, Ibaraki, Japan, 11 to 14 September 2002. ISBN: 1-4020-1228-4

PUB. COUNTRY: Netherlands Antilles

DOCUMENT TYPE: Journal

LANGUAGE: English

ENTRY DATE: Entered STN: 3 Dec 2004
Last Updated on STN: 3 Dec 2004

AB In 2001, Pyricularia oryzae (Magnaporthe grisea) isolates, showing reduced sensitivity to scytalone dehydratase inhibitors, were collected from the Matsuura river area in Saga prefecture, Japan. A single-point mutation causing substitution of one amino acid in scytalone dehydratase was found in those isolates. However, the blast control efficacy of carpropamid in the field has not been completely lost in the area where the mutant isolate is dominant. The results of inoculation tests suggest that enhancement of host defence responses, the other mode-of-action of carpropamid, may contribute to the residual efficacy of carpropamid against the mutants.

L6 ANSWER 6 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:655208 CAPLUS

TITLE: Mode of action of nonfungicidal anti-blast chemicals

AUTHOR(S): Yamaguchi, Isamu

CORPORATE SOURCE: Environmental Plant Research Group, RIKEN Plant Science Center, Tsurumi, Yokohama, 230-0045, Japan

SOURCE: Abstracts of Papers, 228th ACS National Meeting, Philadelphia, PA, United States, August 22-26, 2004 (2004), AGRO-014. American Chemical Society: Washington, D. C. CODEN: 69FTZ8

DOCUMENT TYPE: Conference; Meeting Abstract

LANGUAGE: English

AB While all modern pesticides are developed through extensive safety evaluation, there is a growing public concern about their effects on non-target organisms and the environment. Thus, there is a great deal of renewed interest in nonfungicidal disease controlling agents that are inherently specific to target plant pathogens. Two groups of nonfungicidal chems. of rice blast, a serious rice disease in Japan, are available; melanin biosynthesis inhibitors (MBI and MBI-D) and plant activators or priming effectors, which induce host resistance against the pathogen's attack. Carpropamid, a novel MBI-D, inhibits scytalone dehydratase in the melanin biosynthesis pathway of Magnaporthe grisea, and probenazole induces systemic acquired resistance (SAR) in plants against M. No resistant pathogenic strains have emerged against probenazole in spite of its three decade use. Both chemical groups have high efficacy but low toxicity to non-target organisms. The mol. action and future prospects for related compds. will be discussed.

L6 ANSWER 7 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:599065 CAPLUS
DOCUMENT NUMBER: 139:255905
TITLE: Diagnosis of dehydratase inhibitors in melanin biosynthesis inhibitor (MBI-D) resistance by primer-introduced restriction enzyme analysis in scytalone dehydratase gene of *Magnaporthe grisea*
AUTHOR(S): Kaku, Koichiro; Takagaki, Makiichi; Shimizu, Tsutomu; Nagayama, Kozo
CORPORATE SOURCE: Life Science Research Institute, Kumiai Chemical Industry Co Ltd, Kikugawa, 439-0031, Japan
SOURCE: Pest Management Science (2003), 59(8), 843-846
CODEN: PMSFCF; ISSN: 1526-498X
PUBLISHER: John Wiley & Sons Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We have established a simple diagnosis method for rice blast fungus resistant to MBI-D. This involves the preparation of PCR templates directly from the lesions in combination with primer-introduced restriction enzyme anal. PCR (PIRA-PCR).
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 8 OF 21 Elsevier BIOBASE COPYRIGHT 2007 Elsevier Science B.V. on STN DUPLICATE

ACCESSION NUMBER: 2003002355 ESBIIOBASE
TITLE: Inhibitors and genetic analysis of scytalone dehydratase confirm the presence of DHN-melanin pathway in sapstain fungi
AUTHOR: Fleet C.; Breuil C.
CORPORATE SOURCE: C. Fleet, Department of Wood Science, University of British Columbia, 4036-2424 Main Mall, Vancouver, B.C. V6T 1Z4, Canada.
E-mail: breuil@interchange.ubc.ca
SOURCE: Mycological Research, (01 NOV 2002), 106/11 (1331-1339), 41 reference(s)
CODEN: MYCRER ISSN: 0953-7562
DOCUMENT TYPE: Journal; Article
COUNTRY: United Kingdom
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The presence of the 1,8-dihydroxynaphthalene (DHN) melanin biosynthesis pathway was demonstrated in several sapstain fungi including *Ceratocystis* and *Ophiostoma*, using both chemical inhibitors and molecular techniques. The inhibitor compounds tricyclazole and carpropamid effectively reduced pigmentation at low concentrations in all tested fungal species, but also lead to growth inhibition at higher concentrations. The inhibitor cerulenin prevented fungal growth in all tested fungi at all tested concentrations, likely due to its inhibitory effect on another enzyme, the metabolically critical fatty acid synthase. Partial DNA sequences for the gene encoding scytalone dehydratase (SD) were obtained from species of *Ceratocystis* and *Ophiostoma* and found to have homology with known respective DHN-SD gene sequences. Sequence analysis of the partial SD amino acid sequences showed greater than 80% similarity among the sapstain species, and corresponded well with known phylogenies of sapstain fungi based on rDNA sequences. Aside from the work carried out on the isolate *O. floccosum* 387N, this is the first known documentation of the melanin pigmentation pathway used by species of the sapstain fungi *Ceratocystis*, *Leptographium* and *Ophiostoma*. Furthermore, since no fungus has ever been found, to our knowledge, to have more than one melanin synthesis pathway, we can state that these species are likely only to use the DHN pathway for melanin production.

L6 ANSWER 9 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:915262 CAPLUS
DOCUMENT NUMBER: 136:162653
TITLE: Design of scytalone dehydratase-inhibiting rice blast fungicides
AUTHOR(S): Basarab, Gregory S.; Jordan, Douglas B.; Gehret, Troy C.; Schwartz, Rand S.; Bonman, J. Michael; Smith, G. Shawn
CORPORATE SOURCE: Experimental Station, Central Research and Development, E. I. Du Pont de Nemours and Co., Wilmington, DE, 19880, USA
SOURCE: ACS Symposium Series (2002), 800 (Synthesis and Chemistry of Agrochemicals VI), 278-291
CODEN: ACSMC8; ISSN: 0097-6156
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB By targeting the enzyme scytalone dehydratase for inhibitor design, a series of highly efficacious rice blast fungicides were identified. Evaluation for disease control in a series of greenhouse and field assays led to the discovery of an exceptionally potent trifluoro-substituted cyanoacetamide. Key to the design effort was the recognition that the lipophilicity of the chemical was generally directly related to inhibitory potency but indirectly related to greenhouse efficacy. The incorporation of fluorine atoms during the design program afforded potent inhibitors and optimized phys.-chemical properties important for bioavailability and superior control of rice blast disease.
REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 10 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 5

ACCESSION NUMBER: 2002:462592 SCISEARCH
THE GENUINE ARTICLE: 556TE
TITLE: Differential inhibition of a melanin biosynthetic enzyme scytalone dehydratase by carpropamid, a fungicide for rice blast control, and its isomers
AUTHOR: Motoyama T; Kagabu S; Matsuoka M; Yamaguchi I (Reprint)
CORPORATE SOURCE: RIKEN, Inst Phys & Chem Res, Wako, Saitama 3510198, Japan (Reprint); RIKEN, Plant Sci Ctr, Wako, Saitama 3510198, Japan; Gifu Univ, Fac Educ, Dept Chem, Gifu 5011193, Japan
COUNTRY OF AUTHOR: Japan
SOURCE: JOURNAL OF PESTICIDE SCIENCE, (2002) Vol. 27, No. 2, pp. 141-144.
ISSN: 0385-1559.
PUBLISHER: PESTICIDE SCI SOC JAPAN, TOKYO UNIV AGR DEPT OF AGR CHEM, TOKYO, 156, JAPAN.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 10
ENTRY DATE: Entered STN: 14 Jun 2002
Last Updated on STN: 14 Jun 2002

L6 ANSWER 11 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:793270 CAPLUS
DOCUMENT NUMBER: 136:98203
TITLE: Structural and functional analysis of scytalone dehydratase required for pathogenicity of the rice blast fungus
AUTHOR(S): Motoyama, Takayuki
CORPORATE SOURCE: RIKEN Institute, Wako, 351-0198, Japan
SOURCE: Nippon Noyaku Gakkaishi (2001), 26(3), 287-291
CODEN: NNGADV; ISSN: 0385-1559
PUBLISHER: Nippon Noyaku Gakkai
DOCUMENT TYPE: Journal; General Review

LANGUAGE: Japanese

AB A review, on use of carpropamid, a tight-binding competitive inhibitor, of scytalone dehydratase (STD) in anal. of STD inhibitory mechanism and tertiary structural and functional anal. of STD.

L6 ANSWER 12 OF 21 CABA COPYRIGHT 2007 CABI on STN

ACCESSION NUMBER: 2000:149723 CABA

DOCUMENT NUMBER: 20001008591

TITLE: Efficient target-site assay of chemicals for melanin biosynthesis inhibition of *Magnaporthe grisea*

AUTHOR: Kim JinCheol; Son MiJung; Kim HeungTae; Choi GyungJa; Hahn HohGyu; Nam KeeDal; Cho KwangYun; Kim, J. C.; Son, M. J.; Kim, H. T.; Choi, G. J.; Hahn, H. G.; Nam, K. D.; Cho, K. Y.

CORPORATE SOURCE: Screening Division, Korea Research Institute of Chemical Technology, P.O. Box 107, Yusong, Taejon 305-600, Korea Republic.

SOURCE: Plant Pathology Journal, (2000) Vol. 16, No. 3, pp. 125-129. 16 ref.

DOCUMENT TYPE: Journal

LANGUAGE: English

ENTRY DATE: Entered STN: 8 Dec 2000

Last Updated on STN: 8 Dec 2000

AB A rapid and efficient assay to determine melanin biosynthesis inhibition of *Magnaporthe grisea*, a causal agent of the rice blast, by chemicals was developed. Wells in 24-well plates were loaded with spore suspension of the fungus and three known melanin biosynthesis inhibitors of KC10017, tricyclazole, and carpropamid. Subsequent color changes of mycelia and culture media in the wells were observed 7 days after incubation. The wells treated with KC10017 (an inhibitor of polyketide synthesis step and/or pentaketide cyclization step) became colourless, whereas tricyclazole (an inhibitor of 1,3,8-trihydroxynaphthalene reductase) or carpropamid (an inhibitor of scytalone dehydratase)-treated wells exhibited red color. They did not show any inhibitory effect on fungal growth. The inhibition of reaction steps prior to 1,3,6,8-tetrahydroxynaphthalene formation was easily determined by colourless medium and mycelia. However, it was impossible to distinguish between inhibition of reduction steps and inhibition of dehydration steps by colors of the cultures. It was accomplished through HPLC analysis of the melanin biosynthesis-involving pentaketide metabolites accumulated by the inhibitors. Through screening of a number of synthetic chemicals using the in vitro assay, we could find a novel chemical group of melanin biosynthesis inhibitor.

L6 ANSWER 13 OF 21 CABA COPYRIGHT 2007 CABI on STN

ACCESSION NUMBER: 1999:107672 CABA

DOCUMENT NUMBER: 19991004383

TITLE: Molecular action mechanism of a new melanin biosynthesis inhibitor

AUTHOR: Motoyama, T.; Nakasako, M.; Yamaguchi, I.; Lyr, H. [EDITOR]; Russell, P. E. [EDITOR]; Dehne, H.-W. [EDITOR]; Sisler, H. D. [EDITOR]

CORPORATE SOURCE: Institute of Physical and Chemical Research (RIKEN), 2-1 Hirosawa, Wako, Saitama 351-0198, Japan.

SOURCE: Modern fungicides and antifungal compounds II. 12th International Reinhardtsbrunn Symposium, Friedrichroda, Thuringia, Germany, 24th-29th May 1998, (1999) pp. 111-119. 13 ref.

Publisher: Intercept Limited. Andover

Price: Conference paper; Book chapter

Meeting Info.: Modern fungicides and antifungal compounds II. 12th International Reinhardtsbrunn Symposium, Friedrichroda, Thuringia, Germany, 24th-29th May 1998.

ISBN: 1-898298-60-2

PUB. COUNTRY: United Kingdom
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 11 Aug 1999
Last Updated on STN: 11 Aug 1999

AB Carpropamid ((1RS, 3SR)-2,2-dichloro-N-[1-(4-chlorophenyl)ethyl]-1-ethyl-3-methylcyclopropanecarboxamide) was recently developed as a potent controlling agent against rice blast disease caused by *Pyricularia oryzae* (teleomorph: *Magnaporthe grisea*). Physiological studies suggested that this non-fungicidal compound specifically inhibits scytalone dehydratase (SDH) in the melanin biosynthetic pathway of *P. oryzae*. Molecular action mechanism of carpropamid was studied by enzyme kinetics and X-ray crystallography with use of a recombinant SDH. SDH was purified from *P. oryzae* and its cDNA was cloned on the basis of its amino acid sequence. Then, a T7 phage promoter-based overexpression system was constructed in *E. coli*. The recombinant SDH produced in *E. coli* exerted specific activity identical to the dehydratase in *P. oryzae* and used for further studies. Inhibition of SDH by carpropamid was observed at very low concentrations of the inhibitor close to the enzyme concentration. This result suggests that carpropamid is a tight-binding inhibitor of SDH. Thus, the inhibition type and the dissociation constant (K_i) was determined for carpropamid by fitting the enzymatic activity data to the specific equations developed for tight-binding inhibitors. The apparent dissociation constants (K_{iapp}) showed a closely linear dependence on the concentration of substrate, suggesting that the predominant type of inhibition of SDH by carpropamid is competitive. The calculated K_i value was 140 pM, which is approximately 2×10^5 times smaller than the K_m for scytalone and is much smaller than the K_i values of the other MBI reported so far. Based on these results, it is concluded that carpropamid directly and specifically inhibits SDH. Interactions which determine this tight binding were revealed by an X-ray crystallographic study. In particular, 3 hydrogen bonds and interactions among aromatic rings are considered to be important. Some amino acid residues involved in the inhibitor binding were exchanged for other amino acids by site-directed mutagenesis and the effects on enzyme activity and inhibitor binding were analysed. Through the study, an interesting function of a C-terminal region of SDH was proposed.

L6 ANSWER 14 OF 21 CABA COPYRIGHT 2007 CABI on STN

ACCESSION NUMBER: 1999:4224 CABA
DOCUMENT NUMBER: 19981009354
TITLE: Molecular action mechanism of nonfungicidal anti-blast chemicals
AUTHOR: Yamaguchi, I.; Motoyama, T.; Nakasako, M.; Kuhr, R. J. [EDITOR]; Motoyama, N. [EDITOR]
CORPORATE SOURCE: Institute of Physical and Chemical Research (RIKEN), 2-1 Hirosawa, Wako, Saitama 351-01, Japan.
SOURCE: Pesticides and the future: minimizing chronic exposure of humans and the environment, (1998) pp. 225-230. 7 ref.
Publisher: IOS Press. Amsterdam
ISBN: 90-5199-388-9
PUB. COUNTRY: Netherlands Antilles
DOCUMENT TYPE: Miscellaneous
LANGUAGE: English
ENTRY DATE: Entered STN: 12 Jan 1999
Last Updated on STN: 12 Jan 1999

AB When scytalone was treated with a crude cell-free extract of the P2 strain of *Pyricularia oryzae* [*Magnaporthe grisea*], products formed appear to include 1,3,8-trihydroxynaphthalene (T3HN), the dehydration product of scytalone, and an autooxidation analog of T3HN. The appearance of both products was inhibited by carpropamid, suggesting that carpropamid can inhibit dehydration of

scytalone without affecting the formation of scytalone dehydratase (SDH) itself in *M. grisea*. Recombinant studies with *E. coli* indicated that carpropamid directly and specifically inhibits SDH.

L6 ANSWER 15 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 6

ACCESSION NUMBER: 1998:547868 SCISEARCH
THE GENUINE ARTICLE: 101XQ
TITLE: Cryogenic X-ray crystal structure analysis for the complex of scytalone dehydratase of a rice blast fungus and its tight-binding inhibitor, carpropamid: The structural basis of tight-binding inhibition
AUTHOR: Nakasako M; Motoyama T; Kurahashi Y; Yamaguchi I (Reprint)
CORPORATE SOURCE: RIKEN, Inst Phys & Chem Res, Wako, Saitama 3510198, Japan (Reprint); Japan Sci & Technol Corp, Precursory Res & Embryon Sci & Technol, Tokyo 1130032, Japan; Univ Tokyo, Inst Mol & Cellular Biosci, Bunkyo Ku, Tokyo 1130032, Japan; Nihon Bayer Agrochem KK, Yuki Res Ctr, Ibaraki, Osaka 3070001, Japan
COUNTRY OF AUTHOR: Japan
SOURCE: BIOCHEMISTRY, (14 JUL 1998) Vol. 37, No. 28, pp. 9931-9939
ISSN: 0006-2960.
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 25
ENTRY DATE: Entered STN: 1998
Last Updated on STN: 1998

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Scytalone dehydratase is a member of the group of enzymes involved in fungal melanin biosynthesis in a phytopathogenic fungus, *Pyricularia oryzae*, which causes rice blast disease. Carpropamid [(1RS,3SR)-2,2-dichloro-N-[(R)-1-(4-chlorophenyl)ethyl]-1-ethyl-3-methylcyclopropanecarboxamide] is a tight-binding inhibitor of the enzyme. To clarify the structural basis for tight-binding inhibition, the crystal structure of the enzyme complexed with carpropamid was analyzed using diffraction data collected at 100 K. The structural model was refined to a crystallographic R-factor of 0.180 against reflections up to a resolution of 2.1 Angstrom. Carpropamid was bound in a hydrophobic cavity of the enzyme. Three types of interactions appeared to contribute to the binding, (i) A hydrogen bond was formed between a chloride atom in the dichloromethylethylcyclopropane ring of carpropamid and Asn-131 of the enzyme. (ii) The (chlorophenyl)ethyl group of carpropamid built strong contacts with Val-75, and this group further formed a cluster of aromatic rings together with four aromatic residues in the enzyme (Tyr-50, Phe-53, Phe-158, and Phe-162), (iii) Two hydration water molecules bound to the carboxamide group of carpropamid, and they were further hydrogen-bonded to Tyr-30, Tyr-50, His-85, and His-110. As a result of interactions between carpropamid and the phenylalanine residues (Phe-158 and Phe-162) in the C-terminal region of the enzyme, the C-terminal region completely covered the inhibitor, ensuring its localization in the cavity.

L6 ANSWER 16 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 7

ACCESSION NUMBER: 1999:107314 CAPLUS
DOCUMENT NUMBER: 130:149804
TITLE: Carpropamid. A rice fungicide with two modes of action
AUTHOR(S): Thieron, M.; Pontzen, R.; Kurahashi, Yoshio
CORPORATE SOURCE: Inst. Biologie III, RWTH, Aachen, D-52056, Germany
SOURCE: Pflanzenschutz-Nachrichten Bayer (German Edition) (1998), 51(3), 259-280
CODEN: PNBAYT; ISSN: 0340-1723

PUBLISHER: Bayer AG
DOCUMENT TYPE: Journal
LANGUAGE: German

AB The effects of carpropamid were investigated on the inhibition of melanin biosynthesis, the efficiency of this effect on the interaction between *Pyricularia oryzae* and rice plants, and the induction of resistance in rice. The inhibition of melanin biosynthesis by carpropamid is abolished by the addition of the melanin precursor 1,8-dihydroxynaphthalene (1,8-DHN). This results in a rise of pigmented appressoria on carpropamid treated rice leaves from 5 to 30% after the addnl. application of 1,8-DHN. These pigmented appressoria regain the capability to penetrate rice cells in the normal way. The penetration frequency rises from 0.5 to 45% without and with 1,8-DHN, resp. Similar results were obtained with the melanin biosynthesis inhibitor fungicide tricyclazole. In the case of tricyclazole the use of the melanin precursors 1,8-DHN and L-DOPA (3,4-dihydrophenylalanine) results in successful colonization of rice plants by the pathogen. After treatment of rice plants with carpropamid and subsequent reversal of its 1st mode of action by 1,8-DHN or L-DOPA fungal development is completely inhibited shortly after penetration. This inhibition correlates with "induced lignification" of infected rice cells and with increased accumulation of the phytoalexins momilactone A and sakuranetin in the infected leaves. Comparative investigations with the resistance inductor DDCC (2,2-dichloro-3,3-dimethylcyclopropane carbonic acid) show that carpropamid induces resistance in rice plants.

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 17 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 8

ACCESSION NUMBER: 1999:107313 CAPLUS
DOCUMENT NUMBER: 130:149803
TITLE: Carpropamid. A new melanin biosynthesis inhibitor
AUTHOR(S): Kurahashi, Y.; Pontzen, R.
CORPORATE SOURCE: Nihon Bayer Agrochem K. K., Yuki, 307, Japan
SOURCE: Pflanzenschutz-Nachrichten Bayer (German Edition) (1998), 51(3), 247-258
CODEN: PNBAT; ISSN: 0340-1723

PUBLISHER: Bayer AG
DOCUMENT TYPE: Journal
LANGUAGE: German

AB The inhibition of melanin biosynthesis by carpropamid was investigated in cultured *Pyricularia oryzae*. Carpropamid inhibited scytalone dehydratase which converts scytalone into 1,3,8-trihydroxynaphthalene by elimination of water and the 2nd dehydration step in which vermeline is converted into 1,8-dihydroxynaphthalene. Thus, scytalone and vermeline were accumulated in the culture filtrate of the fungus.

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 18 OF 21 CAPLUS COPYRIGHT 2007 ACS on STN DUPLICATE 9

ACCESSION NUMBER: 1998:566655 CAPLUS
DOCUMENT NUMBER: 129:299187
TITLE: Molecular action mechanism of nonfungicidal anti-blast chemicals
AUTHOR(S): Yamaguchi, Isamu; Motoyama, Takayuki; Nakasako, Masayoshi
CORPORATE SOURCE: The Institute of Physical and Chemical Research (RIKEN), Saitama, 351-01, Japan
SOURCE: Reviews in Toxicology (Amsterdam) (1998), 2(1-4), 225-230
CODEN: RETOFJ; ISSN: 1382-6980

PUBLISHER: IOS Press
DOCUMENT TYPE: Journal
LANGUAGE: English

AB When scytalone was treated with a crude cell-free extract of the P2 strain of

Pyricularia oryzae, products formed appear to include 1,3,8-trihydroxynaphthalene (T3HN), the dehydration product of scytalone, and an autoxidn. analog of T3HN. The appearance of both products was inhibited by carpropamid, suggesting that carpropamid can inhibit dehydration of scytalone without affecting the formation of scytalone dehydratase (SDH) itself in P. oryzae. Recombinant studies with E. coli indicated that carpropamid directly and specifically inhibits SDH.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 19 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 10

ACCESSION NUMBER: 1998:362015 SCISEARCH
THE GENUINE ARTICLE: ZN123
TITLE: Inhibition of scytalone dehydratase in melanin biosynthesis by carpropamid, a novel rice blast controlling agent
AUTHOR: Motoyama T (Reprint); Imanishi K; Kinbara T; Kurahashi Y; Yamaguchi I
CORPORATE SOURCE: RIKEN, Inst Phys & Chem Res, Wako, Saitama 3510198, Japan (Reprint); Nihon Bayer Agrochem Co Ltd, Yuki Res Ctr, Yuki 3070001, Japan
COUNTRY OF AUTHOR: Japan
SOURCE: JOURNAL OF PESTICIDE SCIENCE, (1998) Vol. 23, No. 1, pp. 58-61.
ISSN: 0385-1559.
PUBLISHER: PESTICIDE SCI SOC JAPAN, TOKYO UNIV AGR DEPT OF AGR CHEM, TOKYO, 156, JAPAN.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 15
ENTRY DATE: Entered STN: 1998
Last Updated on STN: 1998

L6 ANSWER 20 OF 21 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN DUPLICATE 11

ACCESSION NUMBER: 1997:842581 SCISEARCH
THE GENUINE ARTICLE: YF610
TITLE: Carpropamid, an anti-rice blast fungicide, inhibits scytalone dehydratase activity and appressorial penetration in Colletotrichum lagenarium
AUTHOR: Tsuji G (Reprint); Takeda T; Furusawa I; Horino O; Kubo Y
CORPORATE SOURCE: KYOTO UNIV, FAC AGR, PLANT PATHOL LAB, KYOTO 606, JAPAN
COUNTRY OF AUTHOR: JAPAN
SOURCE: PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY, (MAR 1997) Vol. 57, No. 3, pp. 211-219.
ISSN: 0048-3575.
PUBLISHER: ACADEMIC PRESS INC ELSEVIER SCIENCE, 525 B ST, STE 1900, SAN DIEGO, CA 92101-4495 USA.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 22
ENTRY DATE: Entered STN: 1997
Last Updated on STN: 1997

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Biosynthesis of melanin by Colletotrichum lagenarium is essential for appressorial penetration of its host plants. Carpropamid is a novel melanin-inhibiting fungicide for control of rice blast caused by Magnaporthe grisea. In C. lagenarium, appressorial and colonial melanization were inhibited by carpropamid. Accumulation of melanin intermediates, scytalone, was also shown in the culture medium containing carpropamid. One of the enzymes involved in the melanin biosynthesis, scytalone dehydratase catalyzes the conversion of scytalone to

1,3,8-trihydroxynaphthalene. We previously cloned SCD1 gene coding for scytalone dehydratase of *C. lagenarium*. In this study, a recombinant SCD1 expression vector was constructed using pMAL system and the recombinant scytalone dehydratase was purified from transformed *Escherichia coli*. Recombinant SCD1 showed scytalone dehydratase activity in an in vitro reaction using scytalone as substrate. The activity was assayed by measuring the production of 1,3,8-trihydroxynaphthalene or disappearance of scytalone, which was detectable by reverse-phase high-pressure liquid chromatography. Dehydration of scytalone to 1,3,8-trihydroxynaphthalene was inhibited by carpropamid in the in vitro reaction. (C) 1997 Academic Press.

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ACCESSION NUMBER: 88:83205 CABA
DOCUMENT NUMBER: 19881112141
TITLE: The inhibition of melanin biosynthetic reactions in *Pyricularia oryzae* by compounds that prevent rice blast disease
AUTHOR: Wheeler, M. H.; Greenblatt, G. A.
CORPORATE SOURCE: USDA, ARS, SCRL, P.O. Drawer JF, Texas A&M Univ., College Station, TX 77841, USA.
SOURCE: Experimental Mycology, (1988) Vol. 12, No. 2, pp. 151-160. 31 ref.
ISSN: 0147-5975
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 1 Nov 1994
Last Updated on STN: 1 Nov 1994

AB Nine compounds, known to prevent melanin biosynthesis in appressoria of *P. oryzae* and penetration of rice plants via appressoria, inhibited the enzymatic reduction of 1, 3, 6, 8- tetrahydroxynaphthalene and 1, 3, 8-trihydroxynaphthalene to scytalone and vermellone, respectively; they did not inhibit enzymatic reactions that dehydrate scytalone and vermellone to 1, 3, 8-trihydroxynaphthalene and 1,8-dihydroxynaphthalene, respectively. The compounds had the same order of effect in inhibiting reductase reactions as previously reported for preventing penetration of leaf surfaces and inhibiting melanin biosynthesis. Of the 4 strongest reductase inhibitors, tricyclazole, fthalide and pyroquilon are used commercially to prevent rice blast disease and chlobenthiadione is also extremely effective against the disease. Extracts from buff mutants of *P. oryzae* that lack the ability to penetrate leaf surfaces and cause rice blast disease had minimal reductase activity, but carried out normal dehydratase reactions. The buff extracts behaved similarly to those of the wild type treated with strong melanin inhibitors, e.g. tricyclazole. The current in vitro results with cell-free extracts and HPLC techniques complement earlier in vivo results with inhibition of melanin biosynthesis and penetration via appressoria and suggest that the effect of melanin inhibitors on reductase activity can be used to predict their efficacy in preventing rice blast disease.

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INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 12:57:30 ON 24 JAN 2007
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1 FILE ANABSTR
12 FILE BIOENG

59 FILE BIOSIS
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FILE 'SCISEARCH, CAPLUS, BIOSIS, GENBANK, ESBIODBASE, MEDLINE, CABA, EMBASE, LIFESCI, PASCAL' ENTERED AT 12:58:33 ON 24 JAN 2007

L2 462 SEA SCYTALO?(S) DEHYDRATAS?
 L3 120 SEA L2(S) RICE?
 L4 99 SEA L3(S) (INHIBIT? OR CARPROP?)
 L5 63 SEA L2(S) (INHIBIT OR CARPROP? OR ANTAGON?)
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